



Prof. Fahu Chen Receives the 2023 Ho Leung Ho Lee Foundation Award



Prof. Fahu Chen, Chair of ATES, was awarded the 2023 Ho Leung Ho Lee (HLHL) Foundation Award on Science and Technology Progress (Earth Sciences) for his outstanding contribution to the research of climate and environmental changes and their relations with the evolution of human civilizations.

Prof. Fahu Chen has been engaged in crosscutting research on climate change and environmental archaeology. His work has led to significant advancements in the study of loess records, climate and environment changes, and the interaction between prehistoric humans and the environment. His notable achievements include:

- 1) Proposing the concept of "Westerly Mode" of climate change in the Holocene epoch by identifying the different humidity patterns between the Central Asia Arid area and the Asian Monsoon region.
- 2) Advancing the understanding of the relationship between the East Asian summer monsoon and loess dust in the late Quaternary, leading to the findings of major drought events during the Holocene along the marginal East Asia monsoon region. Additionally, he has quantitatively reconstructed Holocene precipitation data in Northern China and identified human-induced sandstorm events during this period.
- 3) Proposing a novel theory regarding prehistoric human dispersal and settlement on the Tibetan Plateau. His findings revealed the presence of the Xiahe Denisovans in the northeast part of the Tibetan Plateau during the Middle Pleistocene, suggesting transcontinental exchanges on agricultural techniques played a key role in the large-scale human settlement in the high-altitude region of the Tibetan Plateau.

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The Ho Leung Ho Lee Foundation is a non-profit scientific and technological award fund established in 1994 by patriotic financial and industrialists from Hong Kong. It is one of China's most prestigious science awards, recognizing major inventions, discoveries and scientific achievements.

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ATES Session Held in AGU 2023 Fall Meeting



◀ ATES session in AGU 2023

The American Geophysical Union (AGU) 2023 Fall Meeting was held at the Moscone Center in San Francisco from December 11th to 15th, with a total of 22,000 scientists from all over the world in attendance. During the event, the Association for Trans-Eurasia Exchange and Silk Road Civilization Development (ATES) organized a session on December 12th titled "Climate and Environment Changes and Their Impact on Trans-Eurasia Exchange and Civilization Along the Silk Road". This session was co-convened by Prof. Juchi Hou from ITPCAS, Associate Prof. Elena Xoplaki from Justus-Liebig-Universität Gießen of Germany, Dr. Haichao Xie, and Dr. Shengqian Chen from ITPCAS.

In his invited talk, Prof. Fahu Chen, the Chair of ATES, presented the most recent research on the impact of Holocene climate change on the westerly-monsoon interaction, and the exchange of agriculture and culture along the Silk Road regions. Following this, 17 scientists from China, Germany, the UK, and Iran delivered oral presentations focusing on topics such as the reconstruction of paleoclimate data and modeling in Eurasia, the relationship between climate and agricultural development along the Silk Road, and the mechanism of human migration and settlement in the Tibetan Plateau and other areas. Additionally, a poster session was organized by ATES. The latest progress of ATES was also showcased at the ITPCAS booth during this AGU.



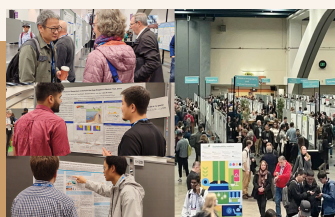
Academician Chen Fahu gave a keynote speech ▶

Background

The American Geophysical Union (AGU), established in 1919, is a global organization of Earth and space scientists that publishes journals, organizes meetings, and supports scientific communication and community. The Association for Trans-Eurasia Exchange and Silk Road Civilizations Development (ATES) was initiated and launched in 2019, as one of the international associations of ANSO (Alliance of International Science Organizations). ATES aims to deepen the understanding of the interactions between environment change, trans-Eurasia exchange and the evolution of Silk Road civilizations through international cooperation across disciplines, regions and languages. ATES has already established 6 working groups.

ITPCAS booth in AGU 2023 ▶

ATES publication ▼



▲ Poster session in AGU

Young scientist ▼



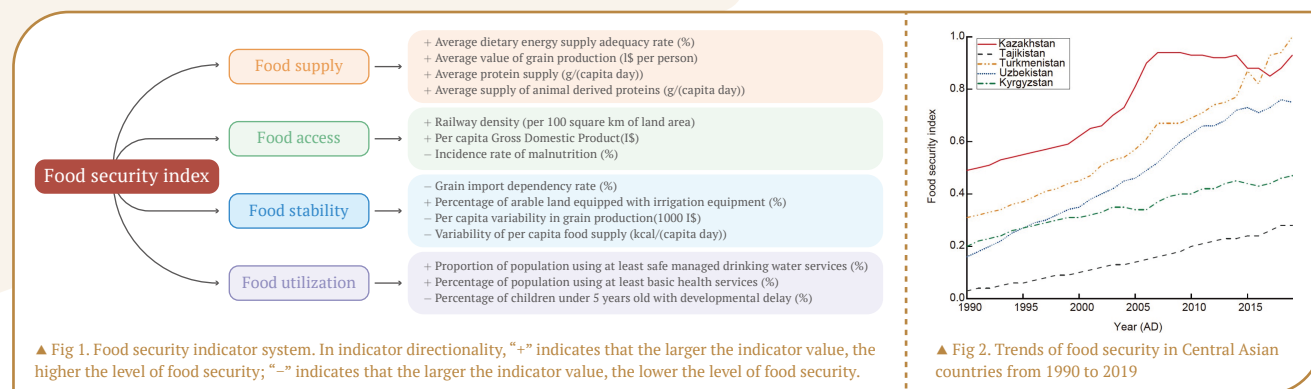
Research Updates

The Level of Food Security in Central Asia is on the Rise but Faces Crisis in the Future

In recent years, the international community has expressed significant concern about climate change's impact upon food security. Central Asia has a delicate ecological environment and underdeveloped agriculture, rendering its food security highly susceptible to climate change. The current and future food security situation in Central Asia not only affects regional development and stability but also presents challenges to building a China-Central Asia community.

In a study published in *Science China Earth Sciences*, researchers found that, while overall food security has improved in the past 30 years, five Central Asian countries face a future crisis due to global warming. The assessment of food security in Central Asia considered availability, accessibility, utilization, and stability, using the Cobb-Douglas-Climate (C-D-C) model. The study conducted a detailed analysis of how climate change and extreme weather events impact food security, predicting future trends under various climate scenarios.

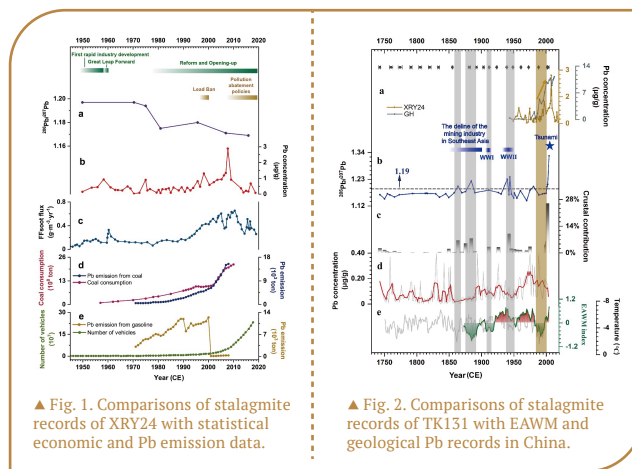
The study reveals a significant impact of climate change on food security in Central Asian countries. Both average annual temperature and precipitation have an inverted U-shaped relationship with food security. Extreme temperatures, both high and low, have substantial negative impacts on food security. Given expected global warming, it is highly likely that the temperature and precipitation will continue to increase, leading to long-term adverse effects on the region's future food security. They emphasize the need for Central Asian countries to take proactive measures, adapting to climate change and reducing greenhouse gas emissions to safeguard future food security. Additionally, they suggest using the Belt and Road Initiative to enhance regional food and agriculture cooperation. This study aims to raise social awareness of climate change, provide a scientific reference for building a food security system in Central Asia, and promote regional cooperation.



Ref.: Su F, Liu Y, Chen L, Orozbaev R, Tan L. 2024. Impact of climate change on food security in the Central Asian countries. *Science China Earth Sciences*, 67, 268-280. <https://doi.org/10.1007/s11430-022-1198-4>

Anthropogenically-induced atmospheric Pb cycle in low-latitude Asia since the Industrial Revolution recorded by high-resolution stalagmites

The previous Pb studies provided a deep insight into the Pb cycle at mid- and polar latitudes, the reconstructions of regional Pb pollution at low latitudes are very limited. This work examined for the first time the effects of atmospheric circulations and anthropogenic Pb emissions on the regional Pb cycle in Asia-Australia by using stalagmite-based Pb records from Klang cave in southern Thailand and Xianrenyan cave in Guangdong province, China. The results find that the Pb records of XRY24 from Xianrenyan cave revealed the Pb emission history in southeastern China over the past ~70 years. While, located in the transition region of Asian-Australian monsoons, the Pb records of TK131 from Klang cave revealed Pb emissions in a large region, with local Pb emissions and long-distance transport of Pb pollutants (LRTP-Pb) jointly affect the Pb cycle in the low-latitude Asia-Pacific region. Moreover, the LRTP-Pb was influenced by the East Asian Winter Monsoon strength before 1980 AD, but was more affected by regional industrial Pb emissions after 1980 AD. This indicates that ever-increasing anthropogenic emission could surpass the atmospheric circulation controls on the regional Pb cycle, offering a new perspective on understanding the relative influence of natural and anthropogenic forcing.



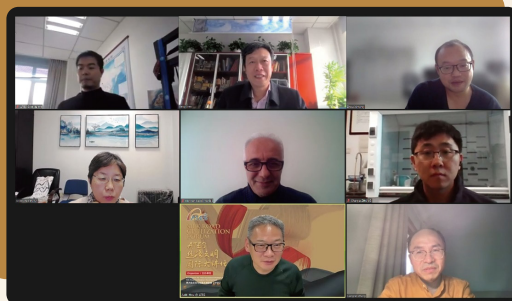
Ref.: Wang T, Yao P H, Shen C C, Chawchai S, Torfstein A, Sinha A, Xu H, Yu T L, Lin F, Wang X, Li D, Cheng H, Edwards R L, An Z, Tan L. 2024. Anthropogenically-induced atmospheric Pb cycle in low-latitude Asia since the Industrial Revolution recorded by high-resolution stalagmites. *Global and Planetary Change*, 232, 104337. <https://doi.org/10.1016/j.gloplacha.2023.104337>

The 5th ATES Silk Road Civilization Forum is held

On 29 December 2023, ATES held its 5th ATES Silk Road Civilization Forum online. Chair of ATES, Prof. Fahu Chen opened by thanking all the participant for the ATES activities.

Hassan Fazeli Nashli, professor of Archaeology at the University of Tehran and important partner of ATES WG2 (Trans-Eurasia Exchange of Early Farming and Herding), gave an insight talk titled: "The cave man and the first farmers: how the nature of society changed during the early Holocene period". He introduced his latest research progress in the northern part of Iran and the southern Caspian Sea, and explained what had happened during the Neolithic revolution in this region from the perspectives of Archaeology, Geoarchaeology and Paleoclimatology. This research has deepened the understanding of the diachronic and synchronic development of agricultural society in the northern part of Iran. In summary, he expected to explore more caves and launch comparison studies in the future, and get sufficient paleoenvironment information from Western and Central Asia to recognize the mechanism of diffusion and migration of early farmers.

After the presentation, Prof. Liangren Zhang (Nanjing University), Prof. Xinying Zhou (The Institute of Vertebrate Paleontology and Paleoanthropology, Chinese Academy of Sciences) and others discussed with Prof. Nashli around the contents of his presentation. The forum was chaired by Prof. Juzhi Hou, the Executive Director of ATES and more than 150 scholars joined the meeting via Zoom and Bilibili.



Notable book



The Contributors to Science and Technology on Ancient Silk Road is a new book written by Dr. Wei Chen by collecting 35 outstanding people who studied hard along the Silk Road on sea and land and made extraordinary achievements in the field of science and technology in the form of their short biographies with pictures to introduce their background, highlights of their achievements, and impacts on future generations. The majority of scientists chosen for the book are ancient, with a few from 19th century covering regions from East Asia to the Mediterranean Sea. It includes 21 scientists from West Asia and North Africa, 4 from South and Southeast Asia, 6 from Europe who have contributed to the scientific and technological exchanges between the East and the West, and 4 from China. It is expected that this book will also help the academic community to build a basic understanding of ancient scientific and technological figures for future study.

CHEN Wei is currently an associate professor at the Institute for the History of Natural Sciences (IHNS), Chinese Academy of Sciences (CAS), a member of the Youth Innovation Promotion Association of CAS, and member of ATES WG4 (Silk Road Science and Technology Exchange).

Upcoming Events

ATES Session in EGU

We would like to invite you to submit abstracts to EGU Session Climate and Environment Changes and their Impact on Trans-Eurasian Exchange and Civilization along the Silk Road (ITS – Inter- and Transdisciplinary Sessions) in 2024 EGU Meeting in Vienna, Austria & Online which will be hold on April 14-19th, 2024.



- **Disciplinary sessions:**

ITS – Inter- and Transdisciplinary Sessions

- **Session Title:**

Climate and Environment Changes and their Impact on Trans-Eurasian Exchange and Civilization along the Silk Road

- **Session Conveners:**

Juzhi Hou, Elena Xoplaki, Krisztina Kinga Hoppál, Haichao Xie, Shengqian Chen

Looking forward to seeing you in Vienna, Austria, or online at the middle of April 2024.

Contact Us

ATES Secretariat
No.16 Lincui Road, Chaoyang District, Beijing
100101, China
ates@itpcas.ac.cn

